

United States District Court  
Northern District of California

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

MAXIM INTEGRATED PRODUCTS,  
INC., et al.,  
Plaintiffs,  
v.  
SILICON MITUS TECHNOLOGY,  
INC., et al.,  
Defendants.

Case No. 17-cv-03507 NC

**CLAIM CONSTRUCTION ORDER**

In this patent infringement action, plaintiffs Maxim Integrated Products, Inc. and Volterra Semiconductor LLC, the patent holders, and Silicon Mitus, Inc. and Silicon Mitus Technology, Inc., the defendants, dispute the construction of fifteen terms across six patents, covering technology for a fuel gauge and a switch-model voltage regulator flip-chip type integrated circuit.

Before the Court is the parties' claim construction disputes. Between the filing of the original claim construction brief by Maxim and the filing of this order, the parties stipulated to the construction of two terms: "unitary gate structure" and "electrode." In addition, the Court declines to construe two of the claim terms because Patent Local Rule 4-3(c) requires that the parties limit themselves to 10 disputed terms. This brings down the number of disputed claim terms to eleven. This order construes those eleven terms.

**I. BACKGROUND****A. The Patents at Issue**

The patents at issue are United States Patent No. 8,198,863, which was issued June 12, 2012; Patent No. 8,502,504, which was issued August 6, 2013; Patent No. 8,203,305, which was issued June 19, 2012; Patent No. 8,643,331, which was issued February 4, 2014; Patent No. 6,278,264, which was issued August 21, 2001; and Patent No. 6,462,522, which was issued October 8, 2002. Jason Allen Wortham is the sole inventor of Patent No. 8,198,863 and its divisional Patent No. 8,502,504. Wortham co-invented Patent No. 8,203,305 and its continuation Patent 8,643,331 with Parviz Ghaseminejad. Andrew J. Burstein and Charles Nickel are the inventors of Patent No. 6,278,264; and its continuation, Patent No. 6,462,522. Maxim is the owner of the fuel gauge patents, and Volterra is the owner of the voltage regulator patents. Dkt. No. 1 at 5-7.

**1. The Fuel Gauge Patents**

These Patents involve measuring the voltage of a battery. Voltage is measured using the open circuit voltage (OCV). The OCV measures voltage when there is no current, and it is a good indicator of the battery's state of charge (SOC). Figure 1 is a graph of the OCV versus the SOC for a single cell Li-Ion battery that shows the OCV to be a good indicator of SOC because the OCV is consistent even as the battery ages. OCV cannot be measured while the battery is on, as no current flows through the circuit. Therefore, the battery's terminal voltage, the voltage across the battery, is measured while the battery is in use to estimate the OCV, which is used to estimate the SOC. As shown in Figure 3, the R-C battery model can track the battery's OCV using the "ideal" curve, even while the battery is in use.

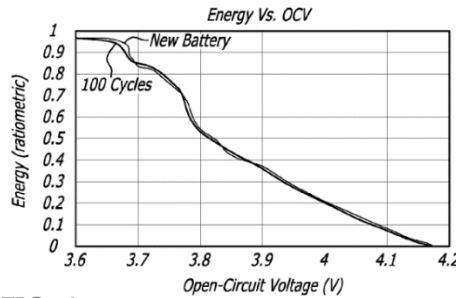


FIG. 1

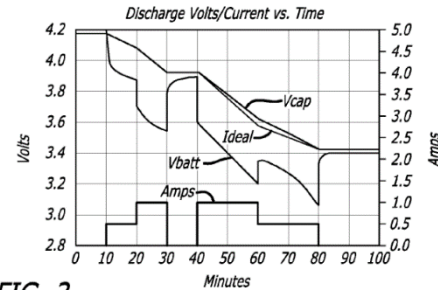


FIG. 3

'863 Patent Figs. 1, 3.

A battery model uses the actual voltage of the battery ( $V_{batt}$ ) as an input to model the voltage across the capacitor in the battery model circuit ( $V_{cap}$ ).  $V_{cap}$  is used to estimate the OCV by using time constants to determine how fast the voltage decreases in the model. Additionally, the invention allows for the combination of the OCV model with a coulomb counter, which counts charge, to provide short and long-term accuracy.

## 2. The Voltage Regulator Patents

The abstract of the '522 Patent provides:

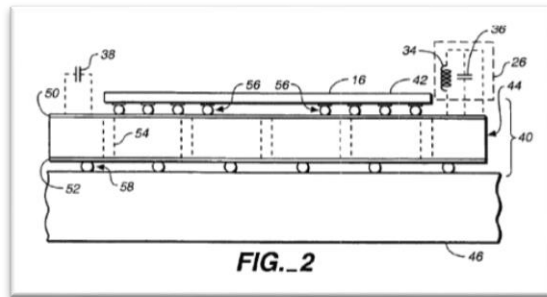
A voltage regulator with an input terminal and an output terminal has a printed circuit board, a substrate mounted on the printed circuit board, and a first flip-chip type integrated circuit chip mounted on the substrate. The first integrated circuit chip includes a first power switch fabricated therein to alternately couple and decouple the input terminal to the output terminal. A filter is disposed to provide a substantially DC voltage at the output terminal, and a control circuit controls the power switch to maintain the DC voltage substantially constant.

'522 Patent Abstract.

In other words, the voltage regulator patents include a flip-chip integrated circuit with increased contact between the flip-chip and mounting surface to reduce the resistance and resulting energy loss by using alternating patterns of pads to increase the contact with the pad area. The flip-chip package from a voltage regulator is shown below in Figure 2. This allows the pads under the flip-chip to access transistors throughout the entire area of the flip-chip, particularly the center of the integrated circuit where the doped regions are located.

The numbers below correspond with the following features of the invention: "the Case No. 17-cv-03507 NC

switching circuit **16** can be fabricated in a flip-chip package **40** that includes an integrated circuit chip **42** and a substrate **44**. The flip-chip package 40 is attached to a printed circuit board (PCB) 46 on which the other components of the power regulator . . . can be mounted.” ‘522 Patent at col. 5:50-55 (bolded numbers in original). “The power switch chip **42** is connected to the top signal layer **50** of the substrate by solder bumps **56** . . . . The bottom signal layer **52** of the substrate **44** is connected to the printed circuit board **46** by additional solder balls **58**.” *Id.* at col. 5:60-66 (bolded numbers in original).



‘522 Patent Fig. 2.

## B. Procedural History

This patent infringement action alleging infringement of six patents was filed on June 16, 2017. Dkt. No. 1. Maxim asserts that Silicon Mitus infringes on its patents. The parties requested that the Court construe 15 terms. *See* Dkt. No. 61. The Court held a technology tutorial and claim construction hearing on the terms on June 6, 2018.

Both parties consented to the jurisdiction of a magistrate judge under 28 U.S.C. § 636(c). Dkt. Nos. 13, 16.

## II. LEGAL STANDARD

The construction of terms found in patent claims is a question of law to be determined by the Court. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). “[T]he interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (quoting *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)). Consequently, courts construe claims in the

1 manner that “most naturally aligns with the patent’s description of the invention.” *Id.*

2 The first step in claim construction is to look to the language of the claims  
3 themselves. *See generally Breville Pty Ltd. v. Storebound LLC*, No. 12-cv-01783 JST,  
4 2013 WL 3153383 (N.D. Cal. June 19, 2013). “It is a ‘bedrock principle’ of patent law  
5 that ‘the claims of a patent define the invention to which the patentee is entitled the right to  
6 exclude.’ ” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water*  
7 *Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). A disputed claim term should  
8 be construed in light of its “ordinary and customary meaning,” which is “the meaning that  
9 the term would have to a person of ordinary skill in the art in question at the time of the  
10 invention, i.e., as of the effective filing date of the patent application.” *Id.* In some cases,  
11 the ordinary meaning of a disputed term to a person of skill in the art is readily apparent,  
12 and claim construction involves “little more than the application of the widely accepted  
13 meaning of commonly understood words.” *Id.* at 1314.

14 Claim construction may deviate from the ordinary and customary meaning of a  
15 disputed term only if (1) a patentee sets out a definition and acts as his own lexicographer,  
16 or (2) the patentee disavows the full scope of a claim term either in the specification or  
17 during prosecution. *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1365  
18 (Fed. Cir. 2012). Ordinary and customary meaning is not the same as a dictionary  
19 definition. “Properly viewed, the ‘ordinary meaning’ of a claim term is its meaning to the  
20 ordinary artisan after reading the entire patent. Yet heavy reliance on the dictionary  
21 divorced from the intrinsic evidence risks transforming the meaning of the claim term to  
22 the artisan into the meaning of the term in the abstract, out of its particular context, which  
23 is the specification.” *Phillips*, 415 F.3d at 1321. Typically, the specification “is the single  
24 best guide to the meaning of a disputed term.” *Vitronics Corp. v. Conceptronic, Inc.*, 90  
25 F.3d 1576, 1582 (Fed. Cir. 1996). It is therefore “entirely appropriate for a court, when  
26 conducting claim construction, to rely heavily on the written description for guidance as to  
27 the meaning of claims.” *Phillips*, 415 F.3d at 1315. However, while the specification may  
28 describe a preferred embodiment, the claims are not necessarily limited only to that

embodiment. *Id.*

Finally, courts may consider extrinsic evidence in construing claims, such as “expert and inventor testimony, dictionaries, and learned treatises.” *Markman*, 52 F.3d at 980. Expert testimony may be useful to “provide background on the technology at issue, to explain how an invention works, to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field.” *Phillips*, 415 F.3d at 1318. However, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.* If intrinsic evidence mandates the definition of a term that is at odds with extrinsic evidence, courts must defer to the definition supplied by the intrinsic evidence. *Id.*

The Court “has an independent obligation to determine the meaning of the claims, notwithstanding the views asserted by the adversary parties.” *Exxon Chem. Patents, Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555 (Fed. Cir. 1995). “In light of this, courts have recognized that in determining the scope and construction of a given claim, ‘the Court is not required to adopt a construction of a term, even if the parties have stipulated to it.’ ” *Lam Research Corp. v. Schunk Semiconductor*, No. 03-cv-1335 EMC, 2014 WL 4180935, at \*6 (N.D. Cal. Aug. 22, 2014) (quoting *Boston Scientific Corp. v. Micrus Corp.*, 556 F. Supp. 2d 1045, 1051 (N.D. Cal. 2008)).

### III. DISCUSSION

The Court orders its discussion as follows: first, the Court discusses the person of ordinary skill in the art (POSITA); second, the Court discusses the stipulated terms and those terms it will not construe; and third, the Court addresses remaining disputed terms.

#### A. Person of Ordinary Skill in the Art

The parties stipulated to who the persons of ordinary skill in the art would be for the asserted patents. As to the fuel gauge patents, the parties stipulated: “A person of ordinary skill in the art in the 2006-2010 time period would have had an undergraduate degree in electrical engineering with three to five years of experience or a master’s degree with one

United States District Court  
Northern District of California

to three years of experience, with the experience relating to the state of charge measurement, including the design of hardware and/or software that implements a fuel gauge.” Dkt. No. 93 at 2. As to the voltage regulator patents, the parties stipulated: “A person of ordinary skill in the art at the relevant time period in 1998-2000 would have had an undergraduate degree in electrical engineering with three to five years of experience or a master’s degree with one to three years of experience, with the experience being in power electronics, including semiconductor design and packaging.” *Id.* The Court adopts the stipulated qualifications.

**B. Stipulated Terms**

The parties agreed to the construction of the two terms: “unitary gate structure” and “electrode.” Dkt. No. 88 at 2.

Claim Terms	Stipulated Construction
“unitary gate structure”	The plain and ordinary meaning, which may include both gate access region 66 and gate stripes 64 to form the unitary gate structure as described in U.S. Patent Nos. 6,278,264, and 6,462,522.
“electrode”	The plain and ordinary meaning.

Because the constructions of these terms have been stipulated to, the Court will not further discuss them in this order. Moreover, the Court declines to construe the following terms consistent with Patent Local Rule 4-3(c): (1) “modeling” and (2) the parties’ dispute as to the limiting or non-limiting nature of certain preambles to the claims. The Court will discuss both “short term” and “long term,” even though they bring the number of disputed terms up to 11, because those terms are necessarily related.

**C. Disputed Terms**

The remaining terms to be construed are: (1) “battery model,” (2) “time constant,” (3) “ordering of steps,” (4) “measured value of current,” (5) “coulomb counter,” (6) “the method of claim 1 of the ‘863 Patent used in addition to a coulomb counter,” (7) “dynamic

electrical characteristics,” (8) “long term” and “short term,” (9) “power switch,” and (10) “alternating pattern.”

**1. “battery model”**

Term	Maxim’s Construction	Silicon Mitus’ Construction
battery model	An approximation of the behavior and operation of a real battery that accounts for the battery’s varying electrical parameters.	Circuit or mathematical implementation of an abstraction that emulates charging/discharging behavior of a battery.

The parties dispute the construction of the term “battery model.” Neither party seeks to define battery model based on its plain and ordinary meaning. This means that either Maxim acted as its own lexicographer, or some other construction of the term applies. The stated points of contention are whether a battery model (i) is an “approximation” or an “abstraction” and (ii) whether the model broadly “accounts for the battery’s varying electrical parameters” or if it is required to “emulate[] charging/discharging behavior.” Dkt. No. 76 at 5. The Court addresses these sub-issues.

**i. “approximation” or “abstraction”**

Maxim argues “battery model” is defined as an “approximation of the behavior” of a battery, while Silicon Mitus argues that the battery model is an “abstraction.” Dkt. No. 67 at 9; Dkt. No. 73 at 6. In particular, Maxim argues that the term “approximation” is correct because it is used in the specification, unlike the term “abstraction.” Dkt. No. 76 at 5. Silicon Mitus adds the word “abstraction” to the term “battery model,” despite largely skating over its reasons for doing so. Silicon Mitus’ argument in total for adding this term is that “[t]he behavioral abstraction is part of the battery model of a real battery.” Dkt. No. 73 at 6 (citing Ehsani Decl.). In other words, Silicon Mitus’s only evidence is extrinsic evidence. But when intrinsic evidence is “at odds with extrinsic evidence, the court must defer to the definition supplied by the intrinsic evidence.” *Phillips*, 415 F.3d at 1318.

Here, there is intrinsic evidence, such as the patent prosecution history and the specification, which support the use of the term “approximation.” The patentee may act as his or her own lexicographer and define a term by implication by “us[ing] a claim term throughout the entire patent specification, in a manner consistent with only a single meaning.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1271 (Fed. Cir. 2001). Maxim acted as its own lexicographer when it defined battery model to include the term “approximation” as shown by the specification. For example, Figure 2 “show a simple RC circuit that to a first order approximation, *approximates* the characteristics of a Li-Ion battery.” ‘863 Patent at col. 2:22-24 (emphasis added). Similarly, Figure 11 “presents a plot the equivalent capacitance of a Li-ion battery versus open circuit voltage and a piecewise *approximation* of that capacitance.” ‘863 Patent at 2:42-44 (emphasis added). Figures 2 and 11 discuss the characteristics of battery models. That those models approximate certain characteristics fits into Maxim’s construction, and Silicon Mitus pointed to no inconsistencies in Maxim’s usage of “approximation.” Therefore, the Court finds that “approximation” is the best interpretation of battery model, and that word is to be used in the definition of battery model based on its ordinary meaning.

**ii. “accounts for the battery’s varying electrical parameters” or is required to “emulates charging/discharging behavior.”**

Silicon Mitus argues that the battery model is required to “[emulate] charging/discharging behavior” because expert evidence states that one of ordinary skill in the art would understand that a battery model “emulates the charging and discharging behavior of a battery.” Dkt. No. 73 at 10. On the other hand, Maxim argues that the battery model “accounts for the battery’s varying electrical parameters,” and that Silicon Mitus’ interpretation of charging and discharging behavior is a narrower construction that fits within Maxim’s construction. Dkt. No. 76 at 5.

Silicon Mitus relies only on expert evidence to support the alleged “charging and discharging” limitations on the battery model. Dkt. No. 73 at 10. Here, Maxim rebuts

1 Silicon Mitus’ overly limiting claim construction by providing intrinsic evidence  
2 demonstrating that to get from the measured terminal voltage to determining the OCV, the  
3 battery model “employs the battery’s varying electrical parameters, such as a time constant  
4 for a given OCV, and corresponding resistance and capacitance values.” Dkt. No. 76 at 6.  
5 Silicon Mitus’ claim construction limiting the model to emulating the battery’s charging  
6 and discharging behavior does not dovetail with the invention.

7 Yet Silicon Mitus is correct in arguing that Maxim’s definition of what is  
8 encompassed in the term “varying electrical parameter” is ambiguous. Dkt. No. 73 at 12.  
9 It is for the Court to resolve such an ambiguity as to a term’s scope. *Core Wireless*  
10 *Licensing S.A.R.L. v. LG Elecs., Inc.*, 880 F.3d 1356, 1360 (Fed. Cir. 2018). Maxim  
11 argues that the inclusion of “varying electrical parameters” is supported by the intrinsic  
12 record of the ‘504 Patent because Figures 2 and 12, which are battery models, are based on  
13 the characteristics of the electrical properties shown in Figures 3 and 11. Dkt. No. 76 at 6;  
14 ‘504 Patent at cols. 2:27-28 (“FIG. 3 presents graphs illustrating the effectiveness of the  
15 simple battery model of FIG. 2”), 2:44-46 (“FIG. 12 is a block diagram illustrating a  
16 digital integrator implementation for a fuel gauge using the piecewise approximation of the  
17 capacitance curves of FIG. 11.”).

18 The ‘504 Patent is part of the fuel gauge patent family, and terms must have the  
19 same construction within the same patent family. *Gemalto S.A. v. HTC Corp.*, 754 F.3d  
20 1364, 1371 (Fed. Cir. 2014). The Court finds that although Maxim’s claim is too broad,  
21 the ‘504 Patent’s Figures 2, 3, 11, and 12 provide support that the battery model accounts  
22 for the following variables necessary to estimate OCV to indicate the state of charge: time  
23 constants, time, resistance, capacitance, current, voltage, and open circuit voltage.

24 In sum, the Court construes “battery model” to mean “an approximation” of the  
25 “varying electrical parameters necessary to estimate OCV in order to indicate the state of  
26 charge (SOC), which are time constants, time, resistance, capacitance, current, voltage, and  
27 open circuit voltage.”  
28

## 2. “time constant”

Term	Maxim’s Construction	Silicon Mitus’ Construction
time constant	The time required for an electrical quantity, such as a current or a voltage, to change from an initial value to a give proportion of the final value or total possible change. All other terms should be given their plan and ordinary meaning.	A representation in the battery model, of a product of a variable capacitance parameter multiplied by a resistance value selected to emulate an intrinsic charge decay characteristic of the battery.

The parties agree on a definition for the term “time constant,” but disagree on whether the time constant is limited to only a “variable time constant,” as Silicon Mitus argues, or if a “fixed time constant” may also be included, as Maxim argues. Dkt. No. 67 at 10. Per Silicon Mitus, Maxim’s one piece of evidence for its proposition that “time constant” may be constant or variable is an example, a concept being explained to the reader. Dkt. No. 73 at 9.

Silicon Mitus further argues that time constants must be variable and cannot be fixed because the specification of the ‘305 and ‘331 Patents specifically states that “any useful implementation of the model must consider that capacitances are strongly dependent on the SOC . . . [i]n practice, an accurate voltage-based fuel gauge can be created using only the 1-pole model, as long as the capacitance is treated dynamically.” ‘305 Patent 9:1-13; Dkt. No. 73 at 9. The specification indicates that  $R1C1$ , the product of resistance and capacitance, is synonymous to time constant. *See* ‘863 Patent at cols. 3:64-4:2 (“The values of  $R1$  and  $C1^1$  of FIG. 2 do not need to correspond to the corresponding values for the battery, but rather should be selected to have the same *time constant*,  $R1C1$ , as the battery appears to have. For the first example, the values of  $R$  and  $C$  are assumed to be

---

<sup>1</sup> In this context, “R” stands for “resistance” and “C” stands for “capacitance.”

constant, i.e., the time constant is constant.”) (emphasis added). Resistance varies based on parameters such as current and temperature. ‘305 Patent at cols. 6:63-7:1 (“the apparent time-constant of such a battery is substantially constant, so that a fixed time-constant may be used in the battery model. (Alternatively, one may also take into consideration the variation of resistance with one or more additional parameters, such as current, temperature or the like.)”).

Silicon Mitus’ argument inserts unwarranted limitations into the specification by requiring a dynamic capacitance, and therefore dynamic time constant, on all possible claimed models, while the specification requires a dynamic capacitance, and therefore a dynamic time constant, on the 1-pole model. ‘305 Patent 9:1-13; Dkt. No. 73 at 9. The specification supports that the time constant is required to be dynamic, but only in the 1-pole model, not in *all* models.

Maxim argues that the patent specification supports a “fixed time constant” because if the construction was limited to “variable time constants,” it would exclude an embodiment of the invention. Dkt. No. 76 at 7. Here, the ‘863 Patent provides an embodiment of the invention in which the capacitance is constant: “the time constant is constant.” ‘863 Patent at col. 4:1-3. “[A] claim construction that does not encompass a disclosed embodiment is thus rarely, if ever, correct and would require highly persuasive evidentiary support.” *Johns Hopkins Univ.*, 152 F.3d at 1355. Silicon Mitus’ argument that the above language is merely explanatory, rather than material that has been claimed, lacks merit. This is because that allegedly explanatory language is within the discussion in the specification in which Figure 2—which is a disclosed embodiment—was discussed. At the *Markman* hearing, Maxim presented an even stronger piece of evidence, claim 21 of the ‘863 Patent. Claim 21 provides: “The method of claim 5 wherein the capacitor in the battery model is a constant value.” ‘863 Patent at col. 10:17-18; *Virnetx, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1317 (Fed. Cir. 2014) (affirming a district court’s construction of a term because certain dependent claims supported a broader construction of the term).

Because the parties do not dispute that a time constant may be variable, and dependent

claim 21 demonstrates that a time constant may also be fixed, the Court finds that the time constant can be variable *or* fixed. Therefore, the Court adopts Maxim's construction of "time constant," which is "the time required for an electrical quantity, such as a current or a voltage, to change from an initial value to a give proportion of the final value or total possible change. All other terms should be given their plan and ordinary meaning." Dkt. No. 67 at 9.

### 3. ordering of steps

Term	Maxim's Construction	Silicon Mitus' Construction
ordering of steps in claims 1, 27, 40, and 56 of '863 Patent; claim 17 of the '305 Patent; and claim 1 of '504 Patent	The steps do not need to be taken in order.	That the steps must be taken in order.

The parties dispute whether the method claims must be taken in the order presented in the claims, as Silicon Mitus claims, or if the steps do not have to be taken in order, as Maxim claims. Silicon Mitus relies on expert evidence and extrinsic evidence of a commercial embodiment, citing *Paulik v. Rizkalla*, 760 F.2d 1270, 1272 (Fed. Cir. 1985), to support its claim. *Id.* Yet *Paulik* does not apply here because it does not involve the question of claim construction. Instead it addressed which inventor was first to reduce the invention to practice. *Paulik*, 760 F.2d at 1272. ("We hold that such resumed activity must be considered as evidence of priority of invention . . . Paulik is not prejudiced by the fact that he had reduced the invention to practice some years earlier.").

Maxim argues that Silicon Mitus improperly relies on dependent claim 10 of the '504 Patent and dependent claim 24 of the '305 Patent to argue the patentee knew how to claim an iterative process and did not do so. Dkt. No. 76 at 7. Maxim asserts that this is improper because independent claims are by definition broader and contain less limitations than dependent claims. *Phillips*, 415 F.3d at 1324. While dependent claims are narrower than independent claims and should therefore not be used to limit independent claims,

1 claim 10 of the ‘504 Patent and claim 24 of the ‘305 Patent *are* independent claims, and  
2 not dependent claims, as Maxim suggests.

3 The parties discuss *Kaneka Corp. v. Xiamen Kingdomway Grp. Co.*, a case  
4 addressing patents covering the process for producing oxidized and reduced coenzymes.  
5 790 F.3d 1298 (Fed. Cir. 2015). *Kaneka* is pertinent because the disputed claim recited the  
6 oxidation step of the chemical process before the extraction step. *Id.* at 1302 (“*oxidizing*  
7 thus-obtained reduced coenzyme Q10 to oxidized coenzyme Q10 *and then* extracting the  
8 oxidized coenzyme Q10 by an organic solvent in a *sealed tank*” (emphasis in original)).  
9 On review of the district court’s finding that the oxidation step must occur before the  
10 extraction step, the Federal Circuit found that even though “*some* oxidation must occur  
11 before the extraction step,” the oxidation step did not need to be completed before the  
12 extraction begins. *Id.* at 1306 (emphasis in original); *id.* (“We hold that the oxidation step  
13 in claims 22 and 33 refers to the product of the previous step, and, therefore, at least some  
14 action resulting in oxidation must be applied to the product of the disruption step in claim  
15 22, and the product of the extraction step in claim 33.”).

16 The court in *Kaneka* acknowledged that a method claim could be construed to  
17 require that steps be performed in order “where the claim implicitly requires order, for  
18 example, if the language of a claimed step refers to the completed results of the prior step.”  
19 *Id.* (citing *E-Pass Techs., Inc. v. 3Com Corp.*, 473 F.3d 1213, 1222 (Fed. Cir. 2007)). A  
20 method claim does not recite an order unless it satisfies the two-part test: (1) the claim  
21 language logically or grammatically requires the steps to be performed in order, or (2) the  
22 specification “directly or implicitly requires such a narrow construction.” *Altiris, Inc. v.*  
23 *Symantec Corp.*, 318 F.3d 1363, 1369-70 (Fed. Cir. 2003).

24 Here, this case is similar to *Kaneka*, but not entirely analogous. Claim 1 of the ‘863  
25 Patent provides in relevant part:

1 . . . *estimating an open circuit voltage of the battery* using the  
battery model and the battery terminal voltage, including when  
2 delivering current to a load on the battery; and,  
3 . . . *estimating the state of charge of the battery based on the  
estimated open circuit voltage* of the battery and the battery  
model.

4 ‘863 Patent at col. 9:9-15 (emphasis added).<sup>2</sup> Thus, it appears from the plain text of the  
5 claim that *some* estimation of OCV must be done before “estimating” the state of charge  
6 based on the estimated OCV. What is less clear is whether the estimating OCV step must  
7 be *complete* before the estimating SOC based on OCV, or, as Maxim asserts, the steps may  
8 be done in an iterative fashion. Maxim fails to support its position that the order of steps  
9 in claims with iterations should be treated differently than non-iterative claims, like that of  
10 *Kaneka*, and it cannot overcome the logical construction of the patent.

11 On the second factor identified in *Altiris, Inc.*, the question is more complicated,  
12 because the specification must “directly or implicitly require[] such a narrow  
13 construction.” 318 F.3d at 1369-70. Silicon Mitus’ argument on this point is the fuel  
14 gauge uses voltage on the capacitor in the battery model “to represent the battery’s OCV  
15 using a filter, and the estimated OCV is determined based on a measured voltage and a  
16 battery model filter.” Dkt. No. 73 at 14 (citing ‘305 Patent at col. 4:37-45). Per Silicon  
17

---

18 <sup>2</sup> The Court uses claim 1 of the ‘863 Patent as the example, but the ordering of steps from  
19 the ‘504 Patent and ‘305 Patent is also disputed. The Court’s analysis in the body of this  
20 order also applies to these claims. The addition disputed claim language is:

21 . . . the digital circuit *estimating the open circuit voltage* of the  
battery by repeatedly calculating the open circuit voltage of the  
22 battery using a resistor-capacitor (RC) battery model, and  
*determining the state of charge of the battery from the estimated  
open circuit voltage* . . .

23 ‘504 Patent at col. 9:8-13 (claim 1) (emphasis added);

24 *estimating the open circuit voltage* of the battery circuit using the  
battery circuit model and the battery circuit terminal voltage,  
25 including during the application of a load on the battery circuit;  
26 *estimating the state of charge of the battery based on the estimated  
open circuit voltage* of the battery circuit;

27 ‘305 Patent at col. 16:12-17 (claim 17) (emphasis added).  
28

1 Mitus, to allow the steps to be taken out of order would undermine the purpose of the  
2 invention because the voltage is not determined based on the state of charge. *See id.*

3 The steps of the disputed claims must be taken in order because factors that are  
4 utilized in a step must be established before they are relied upon. The steps in claim 1 of  
5 the ‘504 Patent establish that “the battery model and the battery terminal voltage” must  
6 occur earlier in time than “estimating an open circuit voltage,” because “the battery model  
7 and the battery terminal voltage” must be established before it can be used. ‘504 Patent at  
8 col. 9:1-14. Similarly, “the estimated open circuit voltage of the battery and the battery  
9 model” must occur before “[ii] estimating the state of charge of the battery” because this  
10 step relies on “the estimated open circuit voltage of the battery and the battery model”  
11 which must be established before it is relied upon. Therefore, the Court finds that the  
12 claims language logically and grammatically requires the steps to be performed in order,  
13 and that the specification narrows the construction by implicitly limiting the claims.

14 As to claim 1 of the ‘504 Patent, there is a wrinkle in the analysis. This is because  
15 claim 1 is an apparatus claim, so the order of steps does not typically apply. It is generally  
16 improper to “import a sequential limitation into an apparatus claim.” *Creative Internet*  
17 *Advert. Corp. v. Yahoo! Inc.*, No. 07-cv-00354, 2008 WL 5061625, at \*16 (E.D. Tex. Nov.  
18 24, 2008). However, courts will impose such a sequential order on an apparatus claim  
19 “when the claim language contemplates and explicitly describes a sequential process, or  
20 when the disclosed system performs essentially similar steps as a method claim.”  
21 *Motorola Mobility, Inc. v. Microsoft Corp.*, No. 11-CV-01408 JLR, 2012 WL 12519819, at  
22 \*25 (W.D. Wash. June 4, 2012) (citing *Oak Tech. Inc. v. Int’l Trade Comm’n*, 248 F.3d  
23 1316, 1325 (Fed. Cir. 2001) and *Versata Software, Inc. v. SAP Am., Inc.*, No. 07-cv-  
24 00153, 2009 WL 1408520, at \*13 (E.D. Tex. May 19, 2009), *Gerber Scientific Int’l, Inc. v.*  
25 *Roland DGA Corp.*, No. 06-cv-02024 (CFD), 2011 WL 2133537, at \*1 (D. Conn. May  
26 27, 2011)). In this case, claim 1 of the ‘504 Patent *does* perform essentially the same steps  
27 as a method claim, and the ‘504 Patent’s specification is either the same as, or very similar  
28 to, the other fuel gauge patents’ specifications.

Thus, the steps are limited to the prescribed order in claims 1, 27, 40, and 56 of the ‘863 Patent, the order provided in claim 17 of the ‘305 Patent, and the order provided in apparatus claim 1 of the ‘504 Patent.

#### 4. “measured value of current”

Term	Maxim’s Construction	Silicon Mitus’ Construction
measured value of current	A measurement of the amount of electric charge provided to and taken from a battery through use of a sense resistor.	Give it its ordinary meaning (“the flow rate of electric charge through a conductor”)

Maxim and Silicon Mitus agree that the plain and ordinary meaning of “current” is “the flow rate of electric charge through a conductor.” Dkt. No. 67 at 1 at 5; Dkt. No. 73 at 15. The disagreement concerns the “measured value of” current. *Id.* Silicon Mitus argues for the ordinary meaning of current to be used, while Maxim seeks to limit this ordinary meaning by restricting the use of the measured value of current “through use of a sense resistor.” *Id.*

Claim construction requires the Court to interpret the disputed claims in order to define the legal rights and boundaries of the patented subject matter, not to change the invention. *Nautilus*, 134 S. Ct. at 2128-29. To prevent a change to the invention, a claim construction may not deviate from the ordinary and customary meaning of a disputed term unless: (1) a patentee sets out a definition and acts as his own lexicographer, or (2) the patentee disavows the full scope of a claim term either in the specification or during prosecution. *Thorner*, 669 F.3d at 1365. To be considered a disavowal, the specification must contain “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” *Teleflex, Inc.*, 299 F.3d at 1327. Additionally, a new limitation that is “not required by the claim language, specification, or prosecution history” cannot be read into a claim. *DSW, Inc.*, 537 F.3d at 1348.

Maxim claims that a “measured value of current” is “a measurement of the amount of electric charge provided to and taken from a battery through use of a sense resistor.”

1 Dkt. No. 67-15. Silicon Mitus argues that Maxim disavowed the term “measured value of  
2 current,” so the term should be given its plain and ordinary meaning. Dkt. No. 73 at 15.  
3 During patent prosecution, Maxim added a limitation to claim 1 by amending the claim to  
4 include the limitation: “without using a measured value of current, estimating an open  
5 circuit voltage of the battery” and “making clear that a measured value of current is not  
6 used.” Dkt. No. 67-4 at 14 (‘863 Patent File History). But Maxim’s construction is  
7 limited to claim 1 and the claims that depend on it. This is evidenced by Maxim’s  
8 amendment of claim 1, which explicitly notes that “if the invention of the independent  
9 claims is used with a coulomb counter as covered in claim 47, measured current is used,  
10 but only for the coulomb counter, not for the methods of the independent claims.” *Id.*  
11 Therefore, Maxim’s apparent limitation extends only to claim 1 and its dependent claims.  
12 However, this does not change the meaning of the term “measured value of current.”

13 Maxim argues that an essential feature of the fuel gauge invention is the lack of  
14 measurement of current through a sense resistor because the invention was meant to  
15 overcome the issue of wasting power by using a sense resistor to measure current. Dkt.  
16 No. 76-13. Maxim cites *MBO Labs., Inc. v. Becton, Dickinson & Co.*, which states that an  
17 essential feature that is clearly in the prosecution history and the specification should be a  
18 required feature of the claims. 474 F.3d 1323, 1330 (Fed. Cir. 2007). Yet Maxim failed to  
19 establish that the lack of measurement of current through a sense resistor is an essential  
20 feature by not sufficiently proving that the feature is necessary to the invention. In  
21 addition, the feature is not clearly established in the specification and prosecution history  
22 as it was in *MBO Labs.* *Id.* (The patentee “clearly indicated via the specification and the  
23 prosecution history that the invention provides, as an essential feature, immediate needle  
24 safety upon removal from the patient. It is therefore appropriate to construe the claims so  
25 as to ensure that they, too, require that feature.”).

26 Although there are examples in the specification which support Maxim’s purported  
27 limitation, such as “a current sensor is required, normally in the form of a current sense  
28 resistor in series with the battery,” ‘863 Patent 1:40-51, this limitation cannot be extended  
Case No. 17-cv-03507 NC 18

to all claims. If the Court were to allow this claim construction, Maxim would be able to impermissibly limit the scope of disavowal by limiting the scope of the term “measured value of current,” and broaden the scope of the method claims and the patent in general.

Thus, the Court finds that the plain and ordinary meaning should be used to interpret the “measured value of current.”<sup>3</sup>

#### 5. “coulomb counter”

Term	Maxim’s Construction	Silicon Mitus’ Construction
coulomb counter	A device that counts the charge provided to and taken from a battery by accumulating successive measurements of current flowing through a sense resistor.	A battery fuel gauge that models the charge provided to and taken from a battery by accumulating successive measurements of current flowing through a sense resistor.

The parties dispute whether a coulomb counter is a counting device, as Maxim asserts, or a device that models, as Silicon Mitus asserts. Dkt. No. 73 at 17. Silicon Mitus argues that coulomb counter should be construed as a device that “models” because coulomb counters are well known to not provide a precise count. Dkt. No. 73 at 17. Coulomb counters are known to have integration errors over time and therefore they do not “count” the electric charge. *Id.* Maxim argues that a coulomb counter is a counting device because it is supported by the patent claims and specification. Dkt. No. 76 at 9.

Silicon Mitus fails to show that precision is necessary for a valid interpretation of a term in a claim construction. Although it is true that to comply with 45 U.S.C § 112’s enablement requirement an invention must allow one of ordinary skill in the art to make and use the invention without undue experimentation, the patent disclosure does not require “one of ordinary skill in the art to make and use a perfected, commercially viable embodiment.” *CFMT, Inc. v. Yieldup Int’l Corp.*, 349 F.3d 1333, 1338 (Fed. Cir. 2003).

<sup>3</sup> Maxim and Silicon Mitus’ agreed-upon plain and ordinary meaning of “current,” which is “the flow rate of electric charge through a conductor.”

The technology must allow one of ordinary skill in the art to make and use the technology, but it does not require perfection in the use of this technology. *Id.*

Moreover, the specification indicates that coulomb counters function as devices that measure current rather than model it. As supported in claim 1 of the ‘331 Patent, the coulomb counter is used to “provide a *measure* of current into and out of the battery.” ‘331 Patent at col. 14:24-25 (emphasis added). Further support is provided in claim 2, which states that a “coulomb counter also provides a *measure* of the accumulated current times time into and out of the battery.” *Id.* at col. 14:43-44 (emphasis added). Additionally, the specification of ‘305 Patent states that coulomb counters “*monitor* the current provided to and taken from the battery” ‘305 Patent at col. 1:24-25 (emphasis added). These descriptions of coulomb counters’ function of measuring charge flow, rather than modeling it, are directly supported in the claims and specification of the patent.

If Silicon Mitus’ construction were adopted, the construction would exclude a preferred embodiment of the invention, particularly the monitoring features of the invention. A coulomb counter is a counting device. Thus, coulomb counter will be construed as “a device that counts the charge provided to and taken from a battery by accumulating successive measurements of current flowing through a sense resistor.” Dkt. No. 67 at 17.

**6. “the method of claim 1 of the ‘863 Patent used in addition to a coulomb counter”**

Term	Maxim’s Construction	Silicon Mitus’ Construction
the method of claim 1 of the ‘863 Patent used in addition to a coulomb counter	The plain and ordinary meaning	Every step of the method of claim 1 is used in addition to a coulomb counter battery model

The parties dispute whether a coulomb counter must be used at every step of method claim 1 of the ‘863 Patent, as Silicon Mitus’ asserts, or if the coulomb counter can be used, but is not a limitation on the claim, as Maxim argues. According to Maxim, Silicon Mitus’ construction reads new limitations into the claim, dkt. no. 76 at 14, and Case No. 17-cv-03507 NC

1 improperly adds the phrase “every step of” to the construction of claim 1 of the ‘863 Patent  
2 without sufficiently supporting this new limitation. Dkt. No. 67 at 18.

3 Silicon Mitus argues that the patentee’s statements support its construction. First  
4 Silicon Mitus quotes the patent prosecution history: “a coulomb counter also requires a  
5 measured value of current, and accordingly is not relevant to the independent claims of the  
6 present application,” and is additionally supported by the specification stating that the fuel  
7 gauge can be used “in addition to the coulomb counter.” Dkt. No. 73 at 18 (citing Dkt. No.  
8 67-4 at 14. This evidence supports that a coulomb counter *may* be used with the method,  
9 not that it *must* be used at every step of the method. This plainly permissive language  
10 actually supports Maxim’s argument.

11 As the Court has repeatedly noted in this order, it is improper to read new  
12 limitations into claims that are “not required by the claim language, specification, or  
13 prosecution history.” *DSW, Inc.*, 537 F.3d at 1348. Although claim 1 of the ‘863 Patent is  
14 a method claim that uses the word “comprising” to indicate that all the elements within  
15 claim 1 must be included,<sup>4</sup> there is no evidence in the claim language that the coulomb  
16 counter should or even must be used. *See Moleculon Research Corp. v. CBS, Inc.*, 793  
17 F.2d 1261, 1271 (Fed. Cir. 1986) (“comprising” opens a method claim to the inclusion of  
18 steps in addition to those stated in the claim); *Kustom Signals, Inc. v. Applied Concepts, Inc.*,  
19 264 F.3d 1326, 1332 (Fed. Cir. 2001). As a result, Silicon Mitus’ suggested construction is  
20 not supported by a textual reading of claim 1 of the ‘863 Patent.

21 Additionally, claim 19 of the ‘863 Patent states that “the method of claim 1 used *in*  
22 *addition to a coulomb counter.*” ‘863 Patent at col. 10:11-12 (emphasis added). The  
23 patentee’s limitation of dependent claim 19 indicates that the independent claim which it  
24 relies on, claim 1, does not include the added limitation, or it would have been redundant  
25

---

26 <sup>4</sup> Claim 1 provides in its preamble, “A method of monitoring the state of charge of a  
27 battery, including when delivering current to a load on the battery, comprising”. ‘863  
28 Patent at col. 9:2-4.

for the patentee to further limit claim 19. *See id.* Silicon Mitus fails to support the added limitation to the claim 1 by not supporting its limitation with adequate evidence in the claim language, specification, or prosecution history. Therefore, the method of claim 1 of the ‘863 Patent used in addition to a coulomb counter is construed as the plain and ordinary meaning.

#### 7. “dynamic electrical characteristics”

Term	Maxim’s Construction	Silicon Mitus’ Construction
dynamic electrical characteristics	The relationship between varying electrical quantities, such as current, voltage, resistance, capacitance, and time constant.	Transient recovery behavior of a battery when transitioning between steady states

Maxim argues that “dynamic electrical characteristics” is the relationship between varying electrical quantities, such as current, voltage, resistance, capacitance, and time constant. Dkt. No. 67 at 20. Maxim supports its construction by arguing that Figures 1, 3, and 11 of the ‘305 Patent support that the electrical quantities are plotted against other electrical quantities rather than time. *Id.* Silicon Mitus argues that “dynamic electrical characteristics” should be construed as “transient recovery behavior of a battery when transitioning between steady states.” Dkt. No. 73 at 18.

The Court first disposes of Silicon Mitus’ construction of the term because it is untethered to the patent, and based entirely on its expert’s declaration. *Id.* at 18-20. Yet this dispute comes down to whether the Court accepts that Maxim acted as its own lexicographer in defining “dynamic electrical characteristics.” “An inventor is permitted to act as his own lexicographer and to assign a unique meaning to a claim term used to describe his own invention. The inventor, however, must do so ‘with reasonable clarity, deliberateness, and precision.’ ” *Apple, Inc. v. Samsung Elecs. Co.*, No. 11-cv-01846 LHK, 2012 WL 1123752, at \*17 (N.D. Cal. Apr. 4, 2012) (citing *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994)). One way that an inventor may signify that he or she is

1 acting as a lexicographer is to use the word “is” before a definition, or to set off the  
 2 defined term by quotation marks. *Sinorgchem Co., Shandong v. Int’l Trade Comm’n*, 511  
 3 F.3d 1132, 1136 (Fed. Cir. 2007). But language such as “for example” or “may be used”  
 4 does “not strongly suggest that the patentee was redefining the term.” *Apple*, 2012 WL  
 5 1123752, at \*18. The patentee may also offer an express definition by using words such as  
 6 “meaning” or “defined as,” *Thorner*, 669 F.3d at 1366, or the patentee may define by  
 7 implication by “us[ing] a claim term throughout the entire patent specification, in a manner  
 8 consistent with only a single meaning.” *Bell Atl.*, 262 F.3d at 1271. But when a claim  
 9 term is defined by implication, “the ‘implied’ redefinition must be so clear that it equates  
 10 to an explicit one.” *Thorner*, 669 F.3d at 1368.

11 Here, Maxim’s definition of “dynamic electrical characteristics” is entirely based on  
 12 the following lines from the ‘305 Patent:

13 Consequently the difference between the open circuit battery  
 14 voltage and the measured battery voltage is a measure of the  
 15 load current. Thus FIGS. 1, 3 and 11 in general illustrate the  
 dynamic electrical characteristics of the battery.

16 ‘305 Patent at col. 7:15-19. The only other places in the patent in which the term  
 17 “dynamic electrical characteristics” is used is in independent method claims 1 and 17.

18 Silicon Mitus proffers its expert’s statement that “Figure 1 and 11 do not involve a  
 19 time component and, as such, there is nothing dynamic about them.” Dkt. No. 73 at 19.  
 20 But “[e]xpert testimony at odds with the intrinsic evidence must be disregarded.” *Network*  
 21 *Commerce.*, 422 F.3d at 1361. The specification states that Figures 1 and 3 illustrate  
 22 “dynamic electrical characteristics,” so the extrinsic expert evidence at odds with the  
 23 specification must not be considered. Dkt. No. 76 at 14. The Court’s difficulty with  
 24 Maxim’s construction is that the words “in general” are closer to those terms like “for  
 25 example” and “may be used” which do “not strongly suggest that the patentee was  
 26 redefining the term.” *Apple*, 2012 WL 1123752, at \*18. The Court is less concerned here  
 27 because the word that proceeds “in general” is “illustrates,” which the Court does find to  
 28 be a definitional term.

Figures 1, 3, and 11 specify electrical qualities such as current, voltage, and capacitance. Dkt. No. 67 at 20. Moreover, the specification of the ‘305 Patent supports the inclusion of “time constant” and “resistance” into Maxim’s construction of “dynamic electrical characteristics.” “Time constant” is supported in the specification as either being a “constant time constant” or varying in time as described in Figure 3. ‘306 Patent at col. 4:19-32. Similarly, “resistance” is supported in the specification, as it describes the approximation shown in Figure 11, which supports that “one may take into consideration the variation of resistance with . . . parameters, such as current, temperature or the like.” ‘306 Patent at col. 6:66-68. The Court also takes into account that the specification supports a resistor-capacitor circuit (RC circuit). As the name indicates, this circuit is dependent on both variables of resistance and capacitance. ‘306 Patent a col. 4:19-25. In particular, Figure 3 supports the discharge over time with a load current, as the patent made clear, resistance varies based on current, and as current is changing over time in Figure 3, it is logical to conclude that resistance is changing over time. *Id.* Thus, time constant and resistance are supported by the specification.

The Court therefore construes “dynamic electrical characteristics” as Maxim argues because Maxim acted as its own lexicographer, and its definition is well-supported in Figures 1, 3, and 11, and the specification’s discussion of those figures. Thus, “dynamic electrical characteristics” is construed as “the relationship between varying electrical quantities, such as current, voltage, resistance, capacitance, and time constant.” Dkt. No. 67 at 20.

#### 8. “long term” and “short term”

Term	Maxim’s Construction	Silicon Mitus’ Construction
long term	Plain meaning	Over many (much more than several) sampling intervals
short term	Plain meaning	Over several sampling intervals

The parties dispute whether the terms “short term” and “long term” should be given

1 their plain meaning as Maxim argues, or defined as over many sampling intervals, as  
2 Silicon Mitus argues. Dkt. No. 73 at 20.

3 Silicon Mitus' position is that the Court should construe these terms because they  
4 are "very significant" to one of the asserted claims, and because they are used across the  
5 patents. *Id.* at 21. Silicon Mitus uses expert evidence to support that short term refers to  
6 "non-dynamic (non-transient) short-term changes in a battery's charging and discharging  
7 behavior." *Id.* (citing Dkt. No. 63-6 at 12 (Ehsani Decl.)). Maxim objects to this  
8 construction because it "add[s] ambiguity to well-known terms." Dkt. No. 67 at 22.  
9 Maxim cites to *W.E. Hall Co. v. Atlanta Corrugating, LLC*, which provides that when the  
10 term is "is sufficiently clear," then resorting to a dictionary is unnecessary. 370 F.3d at  
11 1350; Dkt. No. 67 at 22. Moreover, "short term" and "long term" do not have a meaning  
12 that only a POSITA would understand. Dkt. No. 67 at 22.

13 Silicon Mitus' definition is not supported by the intrinsic evidence. The Court will  
14 not construe a term when a proposed definition does not appear in the intrinsic evidence  
15 and does not decrease ambiguity for the jury. *Vivus, Inc. v. Actavis Labs. FL Inc.*, No. 14-  
16 cv-03786 SRC CLW, 2016 WL 3919455, at \*3 (D.N.J. July 20, 2016). Silicon Mitus'  
17 construction is not supported by the patent because "sampling" and "interval" are—as  
18 Silicon Mitus concedes—nowhere in the patents. Additionally, defining these terms will  
19 not reduce ambiguity for the jury because understanding a term as being "long" or "short"  
20 is less ambiguous than "over many sampling intervals."

21 "Long term" and "short term" should not be construed because the jury must make  
22 the factual finding of the meaning of these terms of approximation, and of whether the  
23 accused products satisfy that approximation. Dkt. No. 67 at 22. It is the job of the jury to  
24 quantify what degree is considered infringement. *Thorner*, 669 F.3d at 1369. Here, the  
25 Court finds that the jury should make the determination of what they consider to be a long  
26 or short term with respect to the patent. Thus, the Court will not construe "long term"  
27 and "short term."

## 9. “power switch”

Term	Maxim’s Construction	Silicon Mitus’s Construction
power switch	One switching element or two switching elements	Either a high-side power switching transistor or a low-side power switching transistor, but not both

Maxim and Silicon Mitus agree that the voltage regulator patents claim a power switch that includes a single switching transistor. Dkt. No. 67 at 24. The dispute is whether the power switch is limited to a single switching transistor or if it can consist of two switching transistors. *Id.* Maxim claims that the power switch may include both switching transistors. Dkt. No. 76 at 16. Furthermore, Maxim argues that its construction is supported by claim 35 of the ‘264 Patent. ‘264 Patent at col. 11:19-21 (“a substrate having a first signal layer with a first electrode to electronically couple the drain pads of the PMOS and NMOS switches to an intermediate terminal”). In other words, the claim language supports power switch being construed with two switches because PMOS and NMOS are each two different types of switches, and the two switches are used together in claim 35.

On the other hand, Silicon Mitus claims that the power switch is limited to only one switching transistor, but not both. Dkt. No. 73 at 24. Silicon Mitus argues that the context of independent claim 26 of the ‘264 Patent indicates that both switches cannot be used at the same time. *Id.* This means that *only* one switch, PMOS or NMOS, could be used at a time. Claim 26 of the ‘264 Patent states that “the first plurality of pads are connected to a first terminal of the voltage regulator and the second plurality of pads are connected to a second terminal in the voltage regulator.” ‘264 Patent at col. 10:50-54. Silicon Mitus uses this claim language to argue that both switches cannot be used together because the claim language of a “first terminal” and a “second terminal” provide context. Dkt. No. 73 at 24. However, Silicon Mitus fails to specify what this “context” is, or how the claim language supports that the switches cannot be used together. *Id.*

Here, claim 35 of the '264 Patent strongly supports Maxim's claim that power switch includes two switches. '264 Patent at col. 11:20-21. The Court disagrees with Silicon Mitus' conclusion that claim 26 limits the construction of power switch to only one switch. Even if it were true that claim 26 limits the term to only one switch, this would only support that a power switch *could* include only one switch, not that it *must be limited* to only one switch.

Maxim further argues that in prior litigation of the voltage regulator patents, Magistrate Judge Joseph C. Spero considered "power switch" to include two switches, and this construction should be applied here. Dkt. No. 76 at 16. The '264 and '522 Patents were before Judge Spero in a patent infringement case, and the terms were construed in that court's order denying a motion for a preliminary injunction. *Volterra Semiconductor Corp. v. Primarion, Inc.*, No. 08-cv-05129 JCS, 2009 WL 6357679, at \*34 (N.D. Cal. Nov. 17, 2009) (finding that in construing claim 1, "the term 'power switch' refers to one or more switches, while the term 'first power switch' refers to the high-side switch and 'second power switch refers to the low-side switch' "). Judge Spero addressed the same question of whether the term "power switch" includes one or two switch elements in his claim construction order. *Volterra Semiconductor Corp. v. Primarion, Inc.*, No. 08-cv-05129 JCS, 2010 WL 653452, at \*35–36 (N.D. Cal. Feb. 22, 2010). Judge Spero defined "power switch" as "one switching element or two switching elements." *Id.* at \*49.

The Court agrees with Judge Spero's conclusion and finds that the '264 Patent supports the use of two switches because claim 1 includes two switches by the phrase "the first power switch includes a plurality of p+ regions fabricated in the n-type region in a first array, and a plurality of n+ regions fabricated in the p-type region in a second array," because these regions indicate the use of two different types of switches, both high-side and low side switches. '264 Patent at col. 9:27-30. As the '522 Patent is a continuation of the '264 Patent, "power switch" must have the same construction in the '522 Patent as in the '264 Patent.

1           Additionally, a new limitation that is “not required by the claim language,  
2 specification, or prosecution history” cannot be read into a claim. *DSW, Inc.*, 537 F.3d at  
3 1348. The Court is unconvinced by Silicon Mitus’ construction, as it does not provide  
4 enough support to limit the term “power switch” to only one switch. The limitation of  
5 only using one switch is not explicitly stated nor strongly implied in the specification.  
6 Although the Court is not bound by Judge Spero’s claim construction, the Court agrees  
7 with Judge Spero’s interpretation of “power switch.” Therefore, “power switch” is  
8 construed as “one switching element or two switching elements.” Dkt. No. 67 at 24.

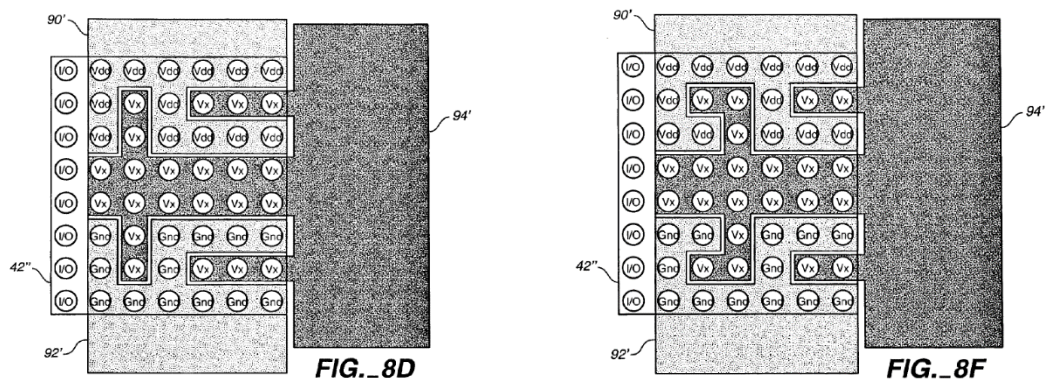
9           **10. “alternating pattern”**

10 <b>Term</b>	<b>Maxim’s Construction</b>	<b>Silicon Mitus’ Construction</b>
11       alternating pattern	12       A form design in which there 13       are changes back and forth	14       Either (i) a “a, b, a, b” pattern 15       or (ii) a checkerboard pattern

16           The parties dispute the construction of “alternating pattern.” The alternating pattern  
17 of pads used in the flip-chip integrated circuit decreases resistance and power loss by  
18 increasing the contact between the mounting surface and the flip-chip. ‘264 Patent at col.  
19 7:45-58. Silicon Mitus argues the “alternating pattern” should be limited to either (i) a “a,  
20 b, a, b” pattern or (ii) a checkerboard pattern, based on expert evidence. Dkt. No. 73 at 26.  
21 Maxim argues that “alternating pattern” is not limited to an “a, b, a, b” or checkerboard  
22 pattern. Dkt. No. 76 at 18. Per Silicon Mitus, however, Judge Spero’s construction in  
23 *Volterra* limits “alternating pattern.” Dkt. No. 73 at 27. Maxim’s response is essentially  
24 that Judge Spero limited the construction because Maxim did not provide a claim  
25 construction at that time, dkt. no. 67 at 27, and Judge Spero lacked Maxim’s expert  
26 testimony for Figure 8A-8G regarding alternating patterns. Dkt. No. 76 at 18.

27           It is improper to read new limitations into claims that are “not required by the claim  
28 language, specification, or prosecution history.” *DSW, Inc.*, 537 F.3d at 1348. The Court  
is not bound by *Volterra*, but will take Judge Spero’s arguments into consideration. It is  
true that Judge Spero did not have all of the evidence presented in this case. Indeed,

Silicon Mitus' expert in this case conceded that "Figures 3A-3C, 6 and 8A-8G of the '264 and '522 patents illustrate various embodiments of the alternating pattern." Dkt. No. 76 at 18 (citing Dkt. No. 64-6 at 9 (Lebby Decl.)). Both Maxim and Silicon Mitus provide expert evidence to support their proposed claim constructions, but Maxim additionally uses intrinsic evidence of Figures 8D and 8F to support alternative shapes supported by the patent specification. As shown, in Figure 8D and 8F, there are alternating patterns that are not limited to parallel rows of pads, such as "J" and "L"-shaped patterns.



Additionally, the patents do not explicitly limit "alternating pattern" to the "a, b, a, b" or checkerboard pattern, so interpreting the claim language as Silicon Mitus suggests would be reading in a limitation into the patents.

Thus, the Court rejects Silicon Mitus' limitations, and finds that "alternating pattern" should be construed as "a form design in which there are changes back and forth." Dkt. No. 67 at 26.

#### IV. CONCLUSION

For the foregoing reasons, the Court construes the disputed terms as follows:

	Term	Construction
1.	battery model	An approximation of the varying electrical parameters necessary to estimate OCV in order to indicate the state of charge, including terms in the specification supporting this estimation: time constants, time, resistance, capacitance, current, voltage, and open circuit voltage.
2.	time constant	The time required for an electrical quantity, such as a current or a voltage, to change from an initial value to a give proportion of the final value or total possible change. All other terms should be given their plan and ordinary meaning.
3.	ordering of steps in claims 1, 27, 40, and 56 of '863 Patent; claim 17 of the '305 Patent; and claim 1 of '504 Patent	Steps must be taken in the prescribed order in claims 1, 27, 40, and 56 of '863 Patent, claim 17 of the '305 Patent, and claim 1 of the '504 Patent.
4.	measured value of current	The plain and ordinary meaning.
5.	coulomb counter	A device that counts the charge provided to and taken from a battery by accumulating successive measurements of current flowing through a sense resistor.
6.	the method of claim 1 of the '863 Patent used in addition to a coulomb counter	The plain and ordinary meaning.
7.	dynamic electrical characteristics	The relationship between varying electrical quantities, such as current, voltage, resistance, capacitance, and time constant.
8.	long term and short term	Not construed.
9.	power switch	One switching element or two switching elements.
10.	alternating pattern	A form design in which there are changes back and forth.

**IT IS SO ORDERED.**

Dated: July 3, 2018

  
 NATHANAEL M. COUSINS  
 United States Magistrate Judge